NATIONAL Diabetes Education PROGRAM

WORKING TOGETHER TO MANAGE DIABETES

A GUIDE FOR PHARMACISTS, PODIATRISTS, OPTOMETRISTS, AND DENTAL PROFESSIONALS

Diabetes: A Major Health Problem

Diabetes is serious, common, costly, but controllable. Diabetes is the sixth leading cause of death in the United States and affects 18.2 million Americans, an estimated 5.2 million of whom have not yet been diagnosed. Diabetes is the number one cause of lower limb amputation not related to trauma, the number one cause of acquired blindness, and the number one cause of kidney disease leading to dialysis in the United States. Diabetes is a major contributor to cardiovascular disease, the number one cause of death in this country. About 65 percent of people with diabetes die from cardiovascular disease.

Diabetes management includes an individualized food plan, monitoring blood glucose as directed by the health care provider, physical activity, and possibly oral medications, insulin, or both.

Type 1 diabetes. Type 1 diabetes (formerly known as insulin-dependent or juvenile-onset diabetes) is an autoimmune disease that is distinguished by the destruction of insulin-producing beta cells. Type 1 diabetes can occur at any age, but type 1 onset usually begins in childhood or the young adult years. People with type 1 diabetes must take insulin daily by injection or insulin pump. They must test their blood glucose levels several times a day, follow an individualized meal plan, and engage in regular physical activity.

Type 2 diabetes. Formerly known as noninsulin-dependent or adult-onset diabetes, type 2 diabetes is related to insulin resistance, whereby the pancreas continues to make insulin, but the insulin is not used well by other body tissues. Eventually, insulin production decreases. Type 2 diabetes affects 8.7 percent of the U.S. population aged 20 and older, occurring more often in adults who are overweight and sedentary. In recent years, however, it has been seen increasingly in young people, including children. The prevalence of type 2 diabetes in younger age groups is of special concern because the risk of complications increases as diabetes duration increases.

Type 2 diabetes disproportionately affects African Americans, Hispanics/Latinos, American Indians and Alaska Natives, and some groups of Asians and Native Hawaiians or other Pacific Islanders. African Americans and Hispanic/ Latino Americans are about twice as likely to have diabetes as non-Hispanic/Latino whites in a similar age group. Some populations of American Indians have the highest rates of diabetes in the world.

Adults with type 2 diabetes are two to four times more likely to have heart disease or suffer a stroke than persons without diabetes. They also are at risk for other complications, such as blindness, kidney disease, amputations, nervous system disease, and gum disease.[2]

Preventing Complications

Comprehensive diabetes care is a team effort involving self-management behaviors (see "Self-Management Support" at the end of this section) by the person with diabetes and complication prevention services by health care providers. At routine visits, health care providers of foot, dental, and eye care and drug therapy management can monitor, prevent, and treat complications.

An important part of diabetes management includes control of risk factors for cardiovascular disease, or the ABCs of diabetes:

A is for A1C, also known as hemoglobin A1C-a test that reflects average blood glucose over the last 3 months. The goal for most people with diabetes is less than 7. An A1C of 7 corresponds to an average blood glucose level of 150 mg/dL.

B is for blood pressure. The goal for people with diabetes is less than 130/80 mm Hg.

C is for cholesterol. The goal for people with diabetes is an LDL level of less than 100 mg/dL.

The Diabetes Control and Complications Trial (DCCT) showed that tight glycemic control reduced risk of microvascular disease in persons with type 1 diabetes (76 percent reduction in eye disease, 50 percent reduction in nephropathy, 60 percent reduction in neuropathy).[3] The United Kingdom Prospective Diabetes Study (UKPDS) showed that, among people with type 2 diabetes, improved glycemic control (average A1C = 7 percent vs average A1C = 7.9 percent in the conventionally treated group) led to a reduction in risk of 25 percent for microvascular disease, 21 percent for retinopathy, 33 percent for albuminuria, 16 percent for myocardial infarction, and 24 percent for cataract extraction. Improved blood pressure control (average of 144/82 mm Hg vs 154/87 mm Hg control) over 8 years led to a reduction in risk of 34 percent for retinopathy, 47 percent for vision loss, 37 percent overall for microvascular disease, 56 percent for heart failure, and 44 percent for stroke incidence.[4] Similarly, multiple studies have shown that lowering LDL cholesterol reduces risk of CVD events.

People with diabetes can take action to lower their risk for heart attack, stroke, and other diabetes complications by controlling the ABCs, following an individualized meal plan, increasing physical activity, avoiding tobacco use, and taking medicines as prescribed. A multidisciplinary team approach is critical to success in diabetes care and prevention. All health care providers can help by discussing how self management and diabetes control relate to preventing complications.

Tools for health care providers and patients can be found on the NDEP Web site at ndep.nih.gov/. The NDEP Team Care monograph (available at ndep.nih.gov/diabetes/pubs/TeamCare.pdf) can tell you more about the advantages of team care and how to form a team, and gives examples of effective team care. For information on the link between diabetes and cardiovascular disease, see ndep.nih.gov/control/cvd.htm.

Diabetes Prevention

An estimated 41 million Americans aged 40 to 74 (40 percent of the U.S. population) have pre-diabetes, a condition that puts them at high risk for developing type 2 diabetes. **Pre-diabetes** is a condition in which blood glucose levels are higher than normal but not in the diabetes range. Pre-diabetes is defined as impaired fasting glucose (IFG) of 100 to 125 mg/dL or impaired glucose tolerance (IGT) diagnosed by a post 75-gram glucose challenge (oral glucose tolerance test or OGTT) of greater than 140 to less than 200 mg/dL or both IFG and IGT. (See appendix B for more information on blood glucose testing.) The *Am I at Risk for Type 2 Diabetes?* brochure, produced by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), can help patients and providers assess individual risk for pre-diabetes.

A major clinical trial - the Diabetes Prevention Program (DPP) - provided scientific evidence that diabetes onset could be prevented or delayed in people at high risk. In the DPP, adults with pre-diabetes reduced their risk of developing diabetes during the course of the study by 58 percent through lifestyle changes in diet and physical activity level (e.g., 30 minutes of brisk walking 5 days a week), resulting in a modest weight loss (5 to 7 percent of body weight). These lifestyle changes worked for men and women and for people of every ethnic or racial group who participated in the study, and such changes were especially successful for people older than age 60.[5]

DPP participants have been enrolled in a continuation study and follow-up data will be forthcoming. Further information on pre-diabetes, testing recommendations, and information on the NDEP's *Small Steps. Big Rewards. Prevent Type 2 Diabetes.* campaign and tools can be found on the NDEP Web site at ndep.nih.gov/get-info/dpl.htm.

Self-Management Support

In contrast to traditional patient education, where information is delivered to the person with diabetes, self-management education involves teaching the behavioral skills needed to make decisions about diabetes management in daily life. Self-management support is a partnership between patient and health care provider. It involves collaborative goal-setting, problem-solving, and individualized behavior-change plans that address concerns identified by the patient as highest priority. Self-management support relies on principles of self efficacy, short-term action plans, realistic goal setting, and proactive identification of barriers to optimal diabetes control. Self-management support involves asking the person with diabetes to identify an accomplishable action he or she would like to take in changing a behavior (e.g., walking 10 minutes a day before dinner starting tomorrow), not telling the individual what to do.

Self-management support does not replace traditional patient education but complements it. Prompting a patient to consider and plan for challenging events is self-management support. For example, after giving information to reinforce a less calorie-dense diet, the health care provider should ask the person with diabetes what he or she thinks will be the greatest challenge in adopting such a diet, and then ask him or her to identify one thing he or she can do differently next time. The step may be small. For example, if the patient identifies eliminating dessert as a problem, ask what action he or she can take toward finding an acceptable alternative. A self-identified change in portion size from two scoops to one of ice cream is an acceptable short-term goal. Support also involves follow up: asking about progress in achieving behavioral goals and supporting problem-solving skills.[6]

Psychosocial considerations and comorbid conditions such as depression can adversely influence self-management behaviors. Multi-disciplinary team care includes working closely with social services, certified diabetes educators, and mental health specialists who can help address these concerns. More information can be found in the NDEP Team Care monograph (available at ndep.nih.gov).

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National Diabetes Education Program (NDEP) http://ndep.nih.gov
NIDDK, National Institutes of Health, Bethesda, MD

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Department of Health
and Human Services
National Institutes of Health (NIH)
Bethesda, Maryland 20892
National Institute of Diabetes &
Digestive & Kidney Diseases (NIDDK)
FIRSTGOV
CDC
Centers for Disease
Control and Prevention